

TITLE OF THE INVENTION

TONER REPLENISHING CONTAINER

BACKGROUND OF THE INVENTION

[0001] This application is based application No. 233449/2000 filed in Japan, the contents of which are hereby incorporated by reference.

Field of the Invention

[0002] The present invention relates to a toner replenishing container for use in image forming apparatuses such as copiers, printers and the like for supplying toner to the same. More particularly, the invention relates to a toner replenishing container with a cap member attached to a mouth of a container body storing toner therein, the container adapted for a positive supply of a proper type of toner to any one of the various types of image forming apparatuses in an application where plural toner replenishing containers are individually filled with any one of the various types of toners different in color or the like for toner supply to the various types of image forming apparatuses.

Description of the Related Art

[0003] In the conventional image forming apparatuses such as copiers, printers and the like, the following procedure is taken to replenish toner to the apparatuses. The procedure includes the steps of filling a toner

replenishing container with toner, and loading the toner replenishing container in the image forming apparatus for supplying the toner from the toner replenishing container to the image forming apparatus.

[0004] The toner for use in the image forming apparatuses is generally varied depending upon the types of the image forming apparatuses. Accordingly, it has been a conventional practice to vary the configuration or the like of the toner replenishing container for toner storage depending upon the types of the image forming apparatuses used.

[0005] Unfortunately, a great number of various toner replenishing containers are required if the toner replenishing container is varied in configuration or the like depending upon the types of the image forming apparatuses used. This leads not only to high production costs but also to a cumbersome management of the containers. Furthermore, the reuse of such toner containers requires the toner containers to be filled with the same type of toners as the previous toners. As a result, an efficient reuse of the toner containers is not accomplished.

[0006] In this connection, it has been contemplated to design the toner replenishing containers for toner storage in a regular configuration and size such that the toner

containers of a kind may store different types of toners so as to be shared by the image forming apparatuses.

[0007] However, the following problem is encountered by the toner replenishing containers of the regular configuration and size which store different types of toners. In the replenishment of toner to an image forming apparatus via a toner replenishing container, an improper type of toner may be inadvertently supplied to the apparatus.

[0008] More recently, a countermeasure against such a problem has been proposed by U.S.P. 5983059 wherein a non-compatible member is removably attached to the toner container, the non-compatible member formed with an engagement portion configured differently depending upon the type or color of toner to be stored in the toner container.

[0009] In the approach wherein the toner container is provided with the non-compatible member formed with the engagement portion varied in configuration depending upon the type or color of the toner, there are required a great number of non-compatible members of various configurations. This still results in the high production costs and the cumbersome management of the non-compatible members.

SUMMARY OF THE INVENTION

[0010] It is an object of the invention to provide toner replenishing containers of a kind capable of storing various toners of different colors or the like for supplying various toners to various types of image forming apparatuses, the toner containers featuring a simple structure added thereto thereby ensuring that the toner replenishing containers are prevented from supplying improper types of toners to the image forming apparatuses.

[0011] According to the invention, the toner replenishing container for supplying toner to the image forming apparatus comprises: a container body for storing toner therein; a cap member attached to a mouth of the container body, the cap member having a toner outlet port and a shutter member for opening/closing the toner outlet port; and an indication member removably attachable to the cap member.

[0012] The position and the number of the indication member to be attached to the cap member are varied depending upon the type of toner stored in the container body. Further, the indication member thus attached to the cap member provides determination as to whether the toner replenishing container may be loaded on a toner supply portion of the image forming apparatus or not.

[0013] The arrangement permits the type of toner stored in the toner replenishing container to be readily

identified based on the position and the number of indication member(s) thus attached. Furthermore, the indication member prevents the toner replenishing container from being loaded on a wrong one of the toner supply portions of the image forming apparatus.

[0014] The arrangement is made such that the indication member to be attached to the cap member is varied in the position and the number thereof depending upon the type of toner stored in the container body. Therefore, a simple arrangement permits the type of toner stored in the toner replenishing container to be distinguished. In addition, the containers are adapted to store different types of toners in a manner to distinctively present the contents thereof through mere variations of the position and the number of the indication members. Hence, the general versatility of the toner replenishing container is enhanced.

[0015] These and other objects, advantages and features of the invention will become apparent from the following description thereof taken in conjunction with the accompanying drawings which illustrate a specific embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] Fig.1 is a front view schematically showing a toner replenishing container according to one embodiment of the invention;

[0017] Fig.2 is a plan view schematically showing the toner replenishing container of the above embodiment;

[0018] Fig.3 is a fragmentary view of the toner replenishing container of the above embodiment for illustrating an indication member inserted to be locked in a suitable one of mounting holes formed in a top surface of a cap member;

[0019] Fig.4 is a front view schematically showing a container body employed by the toner replenishing container of the above embodiment;

[0020] Fig.5 is a plan view schematically showing the container body employed by the toner replenishing container of the above embodiment;

[0021] Fig.6 is a schematic diagram showing a first cap member and a second cap member separated from each other, the first and second cap members belonging to the cap member employed by the toner replenishing container of the above embodiment;

[0022] Fig. 7 is a sectional view schematically showing the first cap member employed by the toner replenishing container of the above embodiment;

[0023] Fig.8 is a side view schematically showing the first cap member employed by the toner replenishing container of the above embodiment;

[0024] Fig.9 is a plan view schematically showing the second cap member employed by the toner replenishing container of the above embodiment;

[0025] Fig.10 is a fragmentary view showing the toner replenishing container of the above embodiment wherein the first cap member and the second cap member are combined with each other;

[0026] Fig.11 is a fragmentary view illustrating the toner replenishing container of the above embodiment loaded on a corresponding one of toner supply portions of the image forming apparatus;

[0027] Fig.12 is a perspective view schematically showing a receptacle of the toner supply portion on which the toner replenishing container of the above embodiment is loaded.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0028] A toner replenishing container according to a preferred embodiment of the invention will hereinbelow be described in detail with reference to the accompanying drawings.

[0029] As shown in Figs.1 and 2, a toner replenishing container A according to the embodiment has an arrangement wherein a cap member 20 is attached to a mouth 11 shaped like a cylinder projecting from an upper end of a container body 10 for storing toner therein.

[0030] The cap member 20 includes a toner outlet port 21 in its upper surface through which the toner stored in the container body 10 is supplied. The cap member 20 is further provided with a shutter mechanism 22 for opening/closing the toner outlet port 21, the mechanism including a guide member 22a disposed in the vicinity of the toner outlet port 21, and a slide member 22b slidably movable along the guide member 22a for opening/closing the toner outlet port 21.

[0031] The cap member 20 is formed with a plurality of mounting holes 23 at suitable positions of the upper surface thereof for receiving an indication member 31. As shown in Fig.3, the indication members 31 are inserted to be locked in some suitable ones of the mounting holes 23 in correspondence to a type of toner stored in the container body 10.

[0032] In the toner replenishing container A of the embodiment, disposed on an outer periphery of the mouth 11 of the container body 10 are a fixing portion 12 for fixing the cap member 20 and a counterrotation-preventing

projection 13 for preventing the cap member 20 from rotating in a reverse direction, as shown in Figs.4 and 5. The projection 13 is located downwardly of the fixing portion 12.

[0033] On the other hand, the cap member used herein includes a first cap member 20a and a second cap member 20b, as shown in Fig.6. The second cap member 20b includes a plurality of locking claws 25a projected toward the first cap member 20a so as to be locked to the first cap member 20a for combining the first cap member 20a and the second cap member 20b together.

[0034] The first cap member 20a includes the toner outlet port 21, the shutter mechanism 22 for opening/closing the toner outlet port 21 and the plural mounting holes 23 for mounting the indication member 31. As shown in Figs.7 and 8, the first cap member 20a is formed with an engagement portion 24 on an inner periphery thereof so as to engage with the fixing portion 12 on the mouth 11 of the container body 11. The first cap member 20a is further formed with a plurality of lock holes 25b in its side wall, which receive the locking claws 25a projected from the second cap member 20b.

[0035] On the other hand, the second cap member 20b is formed with a lock extension 26 on its inner periphery, as shown in Fig.9. The lock extension 26 is locked to the

counterrotation-preventing projection 13 on the mouth 11 of the container body 10, such that the cap member 20 is prevented from rotating in the reverse direction.

[0036] As shown in Fig.10, the first cap member 20a is fitted over the second cap member 20b, thereby bringing the locking claws 25a of the second cap member 20b into locked relation with the lock holes 25b in the side wall of the first cap member 20a for combining together the first cap member 20a and the second cap member 20b. The first cap member 20a may be separated from the second cap member 20b using a suitable jig (not shown) to push the individual locking claws 25a locked to the lock holes 25b thereby releasing the locking claws 25a from the lock holes 25b.

[0037] Next, description is made on a case where the toner replenishing container A of the embodiment is used for supplying a full-color image forming apparatus B with a toner of a suitable color.

[0038] First, a toner of a suitable color is filled in the container body 10 of the toner replenishing container A. In correspondence to the toner thus filled in the container body 10, a suitable number of indication members 31 are inserted to be locked in mounting holes 23 at suitable positions on the upper surface of the first cap member 20a.

[0039] Next, the first cap member 20a is fitted over the second cap member 20b while the locking claws 25a of the second cap member 20b are locked to the lock holes 25b in the side wall of the first cap member 20a. Thus, the first cap member and the second cap member 20b are combined together.

[0040] With the first cap member 20a and the second cap member 20b thus combined together, the engagement portion 24 on the inner periphery of the first cap member 20a is brought into engagement with the fixing portion 12 on the mouth 11 of the container body 10 filled with the toner, while the lock extension 26 on the inner periphery of the second cap member 20b is locked to the counterrotation-preventing projection 13 on the mouth 11 of the container body 11. Thus, the cap member 20 is fitted on the outer periphery of the mouth 11 of the container body 10. The cap member 20 thus mounted is prevented from counterrotating by means of the lock extension 26 of the second cap member 20b locked by the counterrotation-preventing projection 13 on the mouth 11 of the container body 10. It is thus ensured that the cap member 20 is positively prevented from disengaging from the container body 10 due to vibration and the like during transportation, the disengaged cap member resulting in toner leakage or the like.

0041] The toner replenishing container A storing the toner of a suitable color supplies such a toner to the full-color image forming apparatus as follows. As shown in Fig.11, out of a plurality of toner supply portions 30 provided at the full-color image forming apparatus B, a toner supply portion 30 corresponding to the toner of the above color stored in the toner replenishing container A is selected and a lid 31 thereof is opened so as to expose a receptacle 32 on which the toner replenishing container A is loaded (see Fig.12).

0042] The cap member 20 is turned downward with the toner outlet port 21 closed by the slide member 22b disposed at the first cap member 20a of the toner replenishing container A. Then, the indication members 31 inserted in the upper surface of the first cap member 20a are inserted in holes 32a formed at the receptacle 32 so that the toner replenishing container A may be loaded on the receptacle 32 with its lid 31 opened. If, at this time, a color of a toner to be supplied to the toner supply portion 30 does not correspond with that of the toner stored in the toner replenishing container A, the position of the indication member 31 inserted in the upper surface of the first cap member 20a does not coincide with the position of the hole 32a formed at the receptacle 32 of the toner supply portion 30. Therefore, the toner replenishing

container A cannot be loaded on the toner supply portion 30 and hence, the toner of the wrong color is prevented from being supplied.

[0043] After the toner replenishing container A with the cap member 20 turned downward has been loaded on a suitable toner supply portion 30 of the image forming apparatus B, the slide member 22b is slid to open the toner outlet port 21, through which the toner stored in the toner replenishing container A is fed into the image forming apparatus B via the toner supply portion 30. Subsequently, the slide member 22b is slid back to place so as to close the toner outlet port 21. In this state, the toner replenishing container A is removed from the toner supply portion 30 while the lid 31 of the toner supply portion 30 is closed.

[0044] After the toner supply to the image forming apparatus B, the following procedure is taken to fill the toner replenishing container A with fresh toner for reuse of the container. A suitable jig (not shown) is used for pushing the locking claws 25a of the second cap member 20b locked to the lock holes 25b of the first cap member 20a thereby releasing the claws 25a from the lock holes 25b. Thus, the first cap member 20a is separated from the second cap member 20b. Subsequently, the lock extension 26 of the

second cap member 20b is released from the counterrotation-preventing projection 13 of the container body 10.

[0045] The first cap member 20a and the second cap member 20b so separated from each other are rotated in the reverse direction thereby releasing the engagement portion 24 of the first cap member 20a from the fixing portion 12 of the container body 10. Thus, the first cap member 20a and the second cap member 20b are removed from the container body 10.

[0046] If the first cap member 20a and the second cap member 20b are disassembled from the container body 10 in this manner, the cleaning of these parts as well as the toner charging in the container body 10 may be facilitated.

[0047] In a case where the container body 10 is filled with a toner of the same color as that of the previous toner, the indication members 31 inserted to be locked in the mounting holes 23 of the first cap member 20a are used as they are. In a case where the container body 10 is filled with a toner of a different color from that of the previous toner, the indication members 31 inserted and locked in the mounting holes 23 are removed. Subsequently, a suitable number of indication members 31 may be inserted to be locked in suitable mounting holes 23 in the upper surface of the first cap member 20a in correspondence to the color of the toner to be replenished.

[0048] According to the toner replenishing container A of the embodiment, the color of the toner stored in the toner replenishing container A is distinctively presented simply by changing the position and the number of the indication member 31 to be attached to the cap member 20 in correspondence to the color of the toner. This provides for an easy reuse of the toner replenishing container A which may be filled with a toner of a different color from that of the previous toner. As a result, the general versatility of the toner replenishing container is enhanced.

[0049] The embodiment of the invention has been described with reference to the case where the toner replenishing container A is filled with any one of the toners of different colors for supplying a suitably colored toner to the full-color image forming apparatus. However, in a case where the toner replenishing container A is adapted for toner replenishment to various types of image forming apparatuses by being filled with a toner of different characteristics from those of the previous toner, the type of toner stored in the toner replenishing container A may be distinctively indicated by changing the position and the number of the indication member 31 to be attached to the cap member 20 as described in the foregoing.

[0050] Although the present invention has been fully described by way of examples, it is to be noted that various changes and modifications will be apparent to those skilled in the art.

[0051] Therefore, unless otherwise such changes and modifications depart from the scope of the present invention, they should be construed as being included therein.

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